

What is Claimed Is:

1. An apparatus adapted for treating or processing at least one substrate/workpiece in a plasma, comprising:

(a) a chamber defining an interior space;  
(b) means for generating a plasma in said interior space of said  
5 chamber;

(c) mounting means adapted for positioning at least one substrate/workpiece in said interior space of said chamber for receiving treatment in said plasma; and

(d) a gas supply means for injecting gas(es) into said interior space of  
10 said chamber, comprising:

(i) an inlet portion extending exteriorly of said chamber;  
(ii) an outlet portion extending into said chamber and including at least one outlet orifice for injecting gas(es) into said interior space; and  
(iii) means for applying a bias potential to said gas supply  
15 means for suppressing plasma formation at said at least one outlet orifice.

2. The apparatus as in claim 1, further comprising:

(e) means for electrically isolating said gas supply means from said chamber and said means for generating said plasma.

3. The apparatus as in claim 2, wherein:

said outlet portion of said gas supply means extends through an electrically insulated opening in a wall of said chamber.

4. The apparatus as in claim 1, wherein:

said means for applying said bias potential comprises means for applying a DC, AC, or RF bias potential.

5. The apparatus as in claim 4, wherein:  
said means for applying said bias potential comprises means for applying a selected polarity DC bias potential of up to about 1,000 V.

6. The apparatus as in claim 1, wherein:  
said interior space of said chamber is adapted to be maintained at a reduced pressure.

7. The apparatus as in claim 1, wherein said apparatus is adapted to perform a plasma treatment or process selected from the group consisting of: plasma enhanced chemical vapor deposition (PECVD), plasma surface treatment, plasma reaction, plasma etching, reactive plasma etching, sputter etching, reactive sputter etching, sputter deposition, reactive sputter deposition, ion plating, cathodic arc deposition (CAD), ion beam deposition (IBD), and hybrid plasma treatment processes comprising combinations of at least two of the  
5 aforementioned plasma processes.

8. The apparatus as in claim 7, wherein said apparatus is adapted to perform a sputter deposition or reactive sputter deposition process and said means for generating said plasma includes at least one cathode/target assembly.

9. The apparatus as in claim 8, wherein said apparatus comprises a spaced-apart pair of cathode/target assemblies and said mounting means is adapted to position at least one substrate/workpiece in the space between said pair of cathode/target assemblies.

10. The apparatus as in claim 9, wherein said gas supply means is adapted for injecting said gas(es) into said space between said pair of cathode/target assemblies.

11. A method of treating or processing at least one substrate/workpiece in a plasma, comprising steps of:

- (a) providing an apparatus comprising a chamber defining an interior space;
- 5 (b) mounting/positioning at least one substrate/workpiece in said interior space of said chamber;
- (c) injecting gas(es) into said interior space of said chamber by means of an electrically isolated gas supply means having at least one outlet orifice;
- (d) generating a plasma in said interior space of said chamber;
- 10 (e) applying a bias potential to said gas supply means to suppress plasma formation at said at least one outlet orifice; and
- (f) treating/processing said at least one substrate/workpiece in said plasma.

12. The method according to claim 11, wherein:

step (a) comprises providing an apparatus wherein said chamber is adapted to be maintained at a reduced pressure.

13. The method according to claim 12, wherein:

- step (a) comprises providing an apparatus adapted to perform a plasma treatment or process selected from the group consisting of: plasma enhanced chemical vapor deposition (PECVD), plasma surface treatment, plasma reaction,
- 5 plasma etching, reactive plasma etching, sputter etching, reactive sputter etching, sputter deposition, reactive sputter deposition, ion plating, cathodic arc deposition (CAD), ion beam deposition (IBD), and hybrid plasma treatment processes comprising combinations of at least two of the aforementioned plasma processes.

14. The method according to claim 13, wherein:

step (a) comprises providing an apparatus adapted to perform a sputter

deposition or reactive sputter deposition process and includes at least one cathode/target assembly.

15. The method according to claim 14, wherein:

step (a) comprises providing an apparatus including a spaced-apart pair of cathode/target assemblies;

5 step (b) comprises mounting/positioning said at least one substrate/workpiece in the space between said pair of spaced-apart cathode/target assemblies; and

step (c) comprises injecting said gas(es) into said space between said pair of spaced-apart cathode/target assemblies.

16. The method according to claim 15, wherein:

step (b) comprises mounting/positioning at least one disk-shaped substrate/workpiece for a magnetic or magneto-optical (MO) recording medium.

17. The method according to claim 16, wherein:

step (f) comprises reactive sputtering of a ferromagnetic target material in an oxygen-containing plasma to deposit an oxygen-containing ferromagnetic layer on each surface of said at least one substrate/workpiece.

18. The method according to claim 11, wherein:

5 step (c) comprises injecting gas(es) into said interior space of said chamber by means of an electrically isolated gas supply means having an inlet portion extending exteriorly of said chamber and an outlet portion extending into said chamber via an electrically insulated opening in a wall of said chamber.

19. The method according to claim 11, wherein:

step (e) comprises applying a DC, AC, or RF bias potential.

20. The method according to claim 19, wherein:

step (e) comprises applying a selected polarity DC bias potential of up to about 1,000 V.